Space Weather Forecast

Issued on Saturday, 11 June 2022 at 01:16 Local

This forecast provides a four-day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

Space Weather Forecast Headline: Chance of further moderate-class X-ray flares.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity was moderate over the UTC day of Friday 10 June, with the largest X-ray flare a small moderate-class event peaking at 10/1055UTC from a sunspot region on the northeastern horizon of the sun. There were up to four sunspot regions for a time on the Earth-facing disc in the 24 hours, however those near the solar meridian faded to leave the aforementioned northeast as the main area to watch.

A 'disappearing filament' (arc of plasma leaving the sun - a possible Coronal Mass Ejection (CME)) was evident leaving the northwest of the sun around 10/1700UTC on ground-based near infrared imagery. At the time of writing there is no obvious ejecta visible on satellite imagery, however this will be monitored. The only events visible on imagery for the past 24 hours stem from eastern solar horizon or far-side activity, and these are not expected to affect Earth.

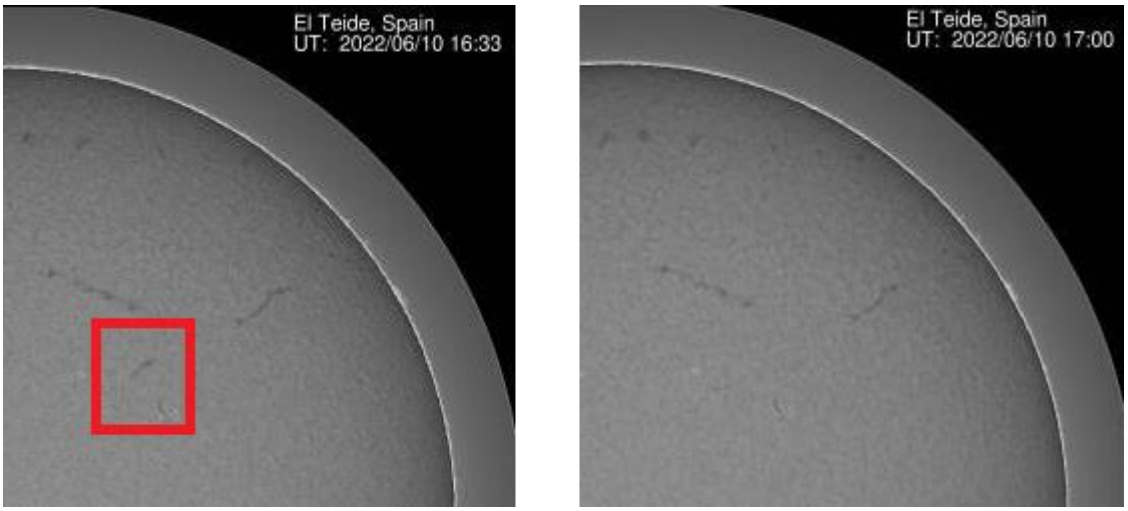

Figure 1: Near infra-red ground-based observatory imagery of a 'disappearing filament' in the northwest quarter of the sun around 10/1700UTC. There is not yet any evidence that this feature left the immediate solar environment, however it will be monitored.

Solar Wind / Geomagnetic Activity: The solar wind was mostly characteristic of a slow regime. The solar wind speed was consequently near background levels throughout. The number of particles in the wind proved to be a little more animated, becoming slightly elevated for a time but soon returning to background levels. The associated magnetic field was less animated, remaining within the normal background range.

The overall effect of the above solar wind measures on geomagnetic activity was quiet throughout,

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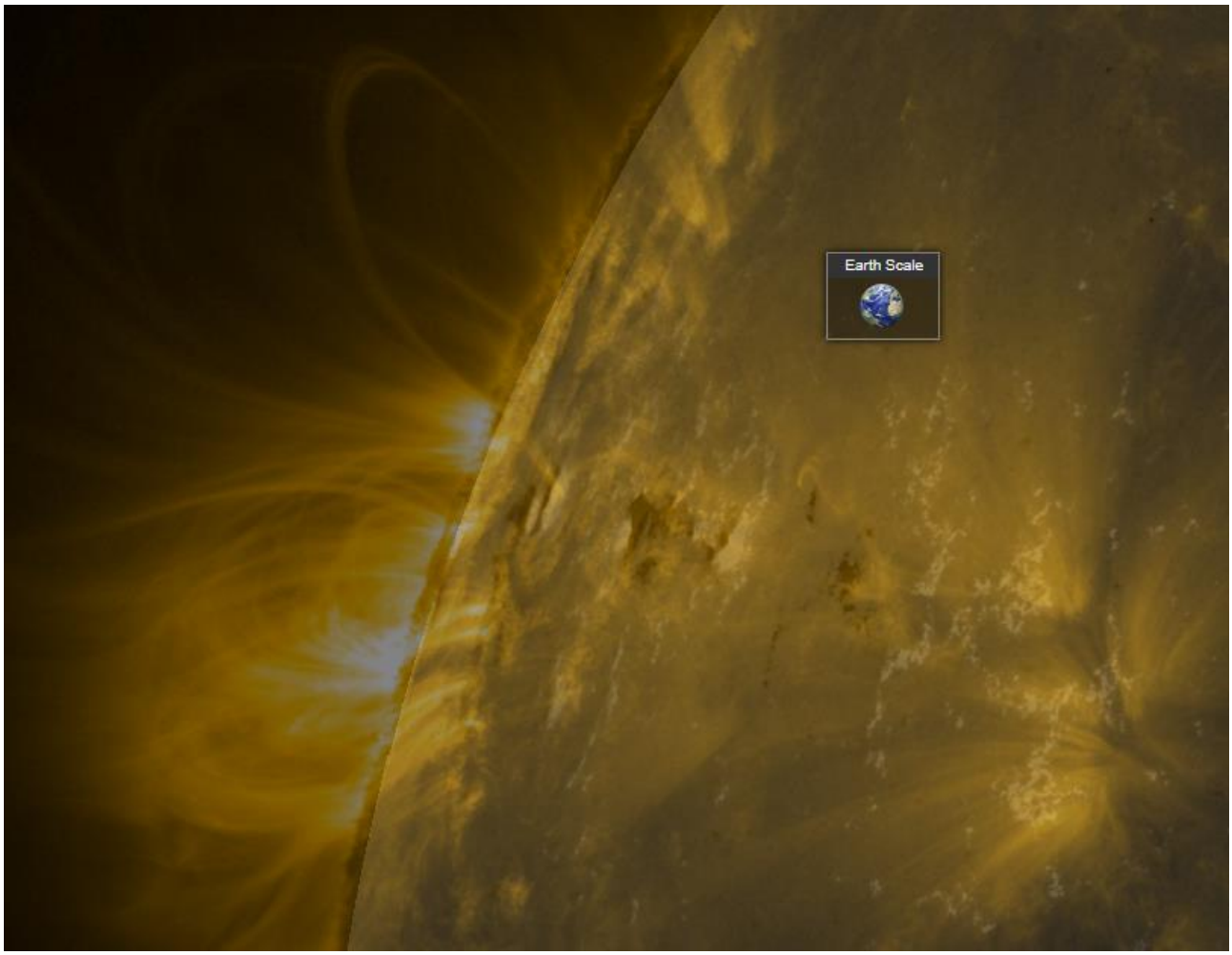
well below Minor Geomagnetic Storm throughout and indeed declining over the UTC day.

Energetic Particles / Solar Radiation: No solar radiation storms were detected.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is expected to be mainly low, but with a daily chance of further moderate-class flares, mainly from the two sunspot regions close to the northeastern solar horizon. No sunspot regions should leave the sun in the period, however further bright regions may rotate on in the coming days, with a tentative increase in risk therefore suggested.

Figure 2: False-colour Helioveiwer.org-generated composite extreme UV light and magnetic polarity image from 10/2200UTC. This highlights the complexity of the northeastern solar horizon sunspot, its neighbour and perhaps arriving region(s) over the northeastern edge of the sun. Also shown is the Earth for scale.



Solar Wind / Geomagnetic Activity: No Earth-directed CMEs currently feature in the forecast. Recent measurements from a satellite two days 'upwind' of Earth suggest a fast wind as potentially arriving at Earth on day two, Sunday 12 June, although activity should be muted, coming in below Minor Storm G1 even at peak, and returning to quiet levels before the end of the coming four days.

Energetic Particles / Solar Radiation: No solar radiation storms are expected.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	1	1	1	1
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	25	30	30	30
Very Active	R3 to R5 X	No	3	5	5	5

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	1	1	1	1
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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